

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor: Zhang et al.

Examiner: Rhonda L. Murphy

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Docket No: 13166RRUS01U

Title: WALSH CODE MANAGEMENT IN A CODE DIVISION MULTIPLE
ACCESS CELLULAR WIRELESS COMMUNICATION SYSTEM

Date: October 6, 2008

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APPEAL BRIEF PURSUANT TO 37 C.F.R. § 41.37

Subsequent to the Final Office Action, a Notice of Appeal with a Pre-Appeal Brief Request for Review was filed and received on June 5, 2008. In response, a Notice of Panel Decision was issued having a mailed date of September 5, 2008, with an indication to proceed to the Board of Patent Appeals and Interferences, creating an Appeal Brief Due date of October 6, 2008, as the period set for taking action ends on a Saturday, Sunday, or Federal Holiday. MPEP § 710.05; MPEP §1206 at page 1200-7. If any petition fee for an extension of time or any other additional fee is required, the undersigned attorney directs the office to debit such fee from deposit account number 50-2126.

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A. Real Party in Interest

All rights to the above referenced patent application have been assigned to:

Nortel Networks Limited
2351 Boulevard Alfred-Nobel
St. Laurent, Quebec, Canada H4S 2A9

B. Related Appeals and Interferences

There are no known other appeals or interferences that would directly or indirectly affect the Board's decision in the present appeal.

C. Status of the Claims

Claims 23-32 are pending. Claims 23-32 stand rejected under 35 U.S.C. 103(a). Claims 23-32 are being appealed. The Section 103(a) rejections were made generally under either Reed or the proffered combination of Reed in view of Wakuta (*see* Final Office Action mailed February 5, 2008 [*hereinafter* Final Office Action]), namely that:

a. Claims 23-27 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,160,798, to Reed et al. (“Reed”).

b. Claims 28-32 were rejected under 35 U.S.C. 103(a) as being unpatentable over Reed in view of U.S. Published Application No. 2005/0221828 to Wakuta et al. (“Wakuta”).

D. Status of Amendments

Subsequent to the Final Office Action, a Notice of Appeal with a Pre-Appeal Brief was filed and received on June 5, 2008. A Notice of Panel Decision from Pre-Appeal Brief Review was sent in response, having a mailed date of September 5, 2008, with an indication to proceed to the Board of Patent Appeals and Interferences. Based on this mailed date, the period for taking action, which in this instance is an Appeal Brief Due, is Monday, October 6, 2008. MPEP § 1206 at page 1200-7. No amendments were filed subsequent to the final rejection.

E. Summary of claimed subject matter

The claims of the present application are directed towards cellular wireless communication systems having improved performance during hand-off and call setup.

As Appellant's Specification points out, in "a typical IS-95A or IS-95B system, 64 Walsh codes are available for use but at least three Walsh codes are dedicated for use with overhead channels. In IS-2000 systems either 64 or 128 Walsh codes are available, depending upon the implementation, with some of these also dedicated to overhead channels. During operation in which an average of 24 users is supported and with which each user is in hand-off with in average of 2.5 sectors a total of 64 Walsh codes would be required. This operational example would fully deplete the available Walsh codes if 64 Walsh codes were available. When all Walsh codes are used for servicing calls for a set of mobile terminals, new call setup and new hand-offs are blocked." (Specification at page 4, ll. 17-24).

Appellant's Specification recites that "during some points in operation, the number of available Walsh codes will be reduced until a Walsh code availability threshold is met, i.e., the number of available Walsh codes is less than the Walsh code availability threshold. When this occurs, the number of forward link transmissions that may be used for each hand-off is reduced .From the maximum number to a lesser number, e.g., four or five. A forced reduction in the number of links per call results in the release or non-use of some Walsh codes." (Specification at page 5, ll. 14-19).

Claims 23-32, of which Claims 23 and 28 are independent claims, are directed towards a method for managing Walsh Codes in a Code Division Multiple Access (CDMA) cellular

wireless communication system, and a base station controller that supports CDMA access operations for a group of cells or sectors.

Appellant's Independent Claim 23 recites a "method for managing Walsh Codes in a Code Division Multiple Access (CDMA) [(see Figures 2 and 3)] cellular wireless communication system [(100 of Figure 1)], the method comprises: allocating a number of Walsh Codes [(see Specification at page 6, *ll.* 24-30)] in the CDMA cellular wireless communication system [(100 of Figure 1)] to a group of cell(s) or sector(s) [(see 120, 122, 124 and 126 of Figure 1)]; setting a handoff participation limit to a maximum participation limit, where the handoff participation limit determines a maximum number of cells or sectors that may participate in handoff with any serviced mobile terminal [(see Specification at page 4, *ll.* 26-32; page 7, *ll.* 28-31 thru page 8, *ll.* 1-2)]; when an available number of the number of Walsh Codes becomes less than a first Walsh Code availability threshold [(304 of Figure 3; see Specification at page 7, *ll.* 28-31 thru page 8, *ll.* 1-2)], reducing the handoff participation limit to a first participation limit that is less than the maximum participation limit [(306 – 310 of Figure 3; see Specification at page 10, *ll.*)]; when an available number of the number of Walsh Codes becomes less than a second Walsh Code availability threshold [(312 of Figure 3; see Specification at page 9, *ll.* 21-32 thru page 10, *ll.* 1-5)], that is less than the first Walsh Code availability threshold, reducing the handoff participation limit to a second participation limit that is less than the first participation limit [(314 – 318 of Figure 3; see Specification at page 9, *ll.* 21-32 thru page 10, *ll.* 1-5)]; and for any mobile terminal participating in handoff with a number of cells or sectors that exceeds the handoff participation limit [(320 of Figure 3; see Specification at page 9, *ll.* 21-32 thru page 10, *ll.* 1-5)], terminating forward link transmissions from a corresponding number of servicing cell(s)

or sector(s) and releasing a corresponding number of Walsh Code(s) [(210 of Figure 2; 322 of Figure 3)].”

Appellant’s Independent Claim 28 recites a “base station controller [(104 and 106 of Figure 1; 502 of Figure 5; *see* Specification at page 12, *ll.* 5-6)] that supports Code Division Multiple Access (CDMA) operations [(*see* Specification at page 9, *ll.* 21-29)] for a group of cells or sectors [(A, B, and C of cell 120 of Figure 1; Specification at page 6, *ll.* 1-7)], the base station controller comprises: a Mobile Switching Center (MSC) interface [(530 of Figure 5; *see* Specification at page 12, *ll.* 12-18)] that interfaces the base station controller {(502 of Figure 5)} to a MSC [(102 of Figure 1; *see* Specification at page 5, *ll.* 29-32)]; at least one base station interface [(534, 538 and 542 of Figure 5; *see* Specification at page 12, *ll.* 12-18)] that interface the base station controller [(502 of Figure 5)] to a plurality of base stations [(108, 110, 112 and 114 of Figure 1; *see* Specification at page 6, *ll.* 1-7)]; and at least one digital processor [(504 of Figure 5; *see* Specification at page 12, *ll.* 12-14)] coupled to the base station interface [(534, 538 and 542 of Figure 5; *see* Specification at page 12, *ll.* 12-18)] and to the MSC interface [(530 of Figure 5; *see* Specification at page 12, *ll.* 12-18)]; and a plurality of software instructions [(416 of Figure 4; *see* Specification at page 11, *ll.* 24-30)] that are executed by the processor [(404 of Figure 4; *see* Specification at page 11, *ll.* 24-30)], the plurality of software instructions include: software instructions that, upon execution by the processor, cause the base station controller [(502 of Figure 5; *see* Specification at page 12, *ll.* 5-6)] to allocate a number of Walsh Codes in the CDMA cellular wireless communication system to the group of cells or sectors [(*see* Specification at page 6, *ll.* 24-30)]; software instructions that, upon execution by the processor, cause the base station controller to set a handoff participation limit to a maximum participation limit [(*see* Specification at page 4, *ll.* 26-32; page 7, *ll.* 28-31 thru page 8, *ll.* 1-2)], where the

handoff participation limit determines a maximum number of cells or sectors that may participate in handoff with any serviced mobile terminal [(see, e.g., Figure 1 mobile terminal positions 130, 132, 134 and 136)]; software instructions that, upon execution by the processor, cause the base station controller [(502 of Figure 5; see Specification at page 12, ll. 5-6)] to, when an available number of the number of Walsh Codes becomes less than a first Walsh Code availability threshold [(304 of Figure 3; see Specification at page 7, ll. 28-31 thru page 8, ll. 1-2)], reduce the handoff participation limit to a first participation limit that is less than the maximum participation limit [(306 – 310 of Figure 3; see Specification at page 10, ll.)]; software instructions that, upon execution by the processor, cause the base station controller [(502 of Figure 5; see Specification at page 12, ll. 5-6)] to, when an available number of the number of Walsh Codes becomes less than a second Walsh Code availability threshold [(312 of Figure 3; see Specification at page 9, ll. 21-32 thru page 10, ll. 1-5)], that is less than the first Walsh Code availability threshold, reduce the handoff participation limit to a second participation limit that is less than the first participation limit [(314 – 318 of Figure 3; see Specification at page 9, ll. 21-32 thru page 10, ll. 1-5)]; and software instructions that, upon execution by the processor, cause the base station controller [(502 of Figure 5; see Specification at page 12, ll. 5-6)] to, for any mobile terminal participating in handoff with a number of cells or sectors that exceeds the handoff participation limit [(320 of Figure 3; see Specification at page 9, ll. 21-32 thru page 10, ll. 1-5)], terminate forward link transmissions from a corresponding number of servicing cell(s) or sector(s) and releasing a corresponding number of Walsh Code(s) [(210 of Figure 2; 322 of Figure 3)].”

F. Grounds of rejection to be reviewed on Appeal

The rejection of Claims 23-27 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,160,798, to Reed et al. (“Reed”).

The rejection of Claims 28-32 under 35 U.S.C. 103(a) as being unpatentable over Reed in view of U.S. Published Application No. 2005/0221828 to Wakuta et al. (“Wakuta”).

G. Argument:

1. Prima Facie showing of Obviousness not established because the cited references of Reed, nor hypothetical combination of Reed and Wakuta do not teach or suggest all of Appellant's claim limitations

In general, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) *must teach or suggest all the claim limitations*. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Appellant's disclosure.

Although the Supreme Court, in re-confirming the *Graham* factors, had admonished the use of the teaching-suggestion-motivation (TSM) test as an end to the obviousness inquiry, "[the Court] also recognized that [the teaching-suggestion-motivation (TSM) rationale] was one of a number of valid rationales that could be used to determine obviousness." MPEP § 2143 at 2100-118 (Rev. 6, Sept. 2007). Under this rationale, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Also, a finding is to be articulated that there was a reasonable expectation of success. MPEP § 2143 (G) at page 2100-138 (Rev. 6, Sept. 2007).

Further, *all claim limitations must be considered*. That is, "[a]ll words in a claim must be considered in judging the patentability of that claim against the prior art. If an independent claim

is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious.” MPEP § 2143.03 at page 2100-142 (Rev. 6, Sept. 2007) (citations omitted).

Appellant respectfully submits that the cited reference of Reed and the hypothetical combination of Reed and Wakuta do not teach or suggest all of Appellant’s claim limitations. Further, Appellant respectfully submits that any suggestion or motivation for the rejection based upon Reed and the hypothetical combination of Reed and Wakuta improperly stems from Appellant’s own specification.

a. Hand-off accelerant of *Reed* lacks all elements of Appellant’s claims because Reed does not, for example, reduce the number of cell sites or sectors, but instead replaces them with less resource burdened sites

Reed describes resource management in a radiotelephone network that is accomplished by load balancing. When it is determined that the network has become out of balance and that too many resources are being used at a particular cell site, the network causes handoff threshold parameters to be changed thereby causing mobile units to change the cell sites with which they are in soft handoff. This reduces the number of mobiles being supported by the overloaded cell site but does not affect the maximum number of cell sites to which each mobile can be in soft handoff. That is, Reed does not reduce the number of cell sites or sectors, but instead *replaces them with less resource burdened sites or sectors* to accelerate handoffs.

Under Reed, when the number of available user spreading codes fall below the threshold, “the process selects a subscriber unit having an established soft handoff link with *a second base station . . .*” (Reed Col. 7:10-15) (emphasis added). “Once the subscriber unit has been selected, the process *then increases reporting thresholds, such as T_{drop} , in the selected subscriber unit to increase the likelihood that . . .* the soft handoff linked with the resource

limited base station will be eliminated.” (Reed Col. 7:29-36) (emphasis added). That is, Reed recites encourages the mobile to transfer its soft handoff connection from a resource limited base station to other soft handoff links of another base station. (See Reed Col. 8:14-36). The process of Reed recites substantiating a base station’s resources with other base stations.

b. Handoff Threshold Variation of *Wakuta* similarly lacks all elements of Appellant’s claim limitations in that it does not recite, for example, reducing the number of links relating to cellular station sectors

Wakuta relates to a “method of handing off a mobile station in a mobile communication system including first and second wireless base stations, comprising the steps of: (a) varying a handoff threshold which is set in the mobile station, according to quality of a wireless link between the mobile station and the first wireless base station which currently controls the mobile station; and (b) handing off the mobile station from the first wireless base station to the second wireless base station, based on the handoff threshold.” (Wakuta ¶ 0022) (emphasis added). That is, Wakuta varies the handoff threshold in each of the mobile stations. (Wakuta, ¶ 0057). Wakuta does not, *inter alia*, recite reducing the number links relating to sectors, but simply recites threshold variation for mobile station handoff.

c. In contrast to the cited references, Appellant’s recited claim limitations relate to “link resource reduction”

The Final Office Action notes that Reed fails to explicitly disclose terminating a weakest forward link when the mobile terminal is in a five-way hand-off. (Final Office Action at page 6). Nevertheless, the Office Action ignores the claim limitations of Appellant’s claims, dismissively stating without precedent or a cited reference that “it would have been obvious to one skilled in the art to adjust, vary, select or optimize the numerical parameters or values of any system absent

a showing of criticality in a particular recited value, so as to eliminate the weakest links in order to increase the available number of spreading codes.” (Office Action at page 6).

Appellant respectfully submits that the neither Reed nor Wakuta teach or suggest all of Appellant’s limitations as set forth in its claims.

Further, Appellant respectfully submits that any suggestion or motivation for the rejection in view of Reed, or Reed and Wakuta, improperly stems from its own application. *In re Rouffet*, 149 F.3d 1350, 1357, (Fed. Cir. 1998); *see also In re Translogic Technology, Inc.*, 2007 U.S. App. LEXIS 23969 (Fed. Cir. Oct. 12, 2007) (a post *KSR International* case referring favorably to *In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998)).

d. Neither Reed nor the hypothetical combination of Reed and Wakuta recite, for example, setting handoff participation limits, reducing handoff participation limits, et cetera as set out in Appellant’s Independent Claims

By way of example, Appellant’s Independent Claim 23 recites, *inter alia*, a “method for managing Walsh Codes in a Code Division Multiple Access (CDMA) cellular wireless communication system, the method comprises: allocating a number of Walsh Codes in the CDMA cellular wireless communication system to a group of cell(s) or sector(s); *setting a handoff participation limit* to a maximum participation limit, where the handoff participation limit determines a maximum number of cells or sectors that may participate in handoff with any serviced mobile terminal; *when an available number* of the number of Walsh Codes becomes less than a first Walsh Code availability threshold, *reducing the handoff participation limit to a first participation limit that is less than the maximum participation limit*; when an available number of the number of Walsh Codes becomes less than a second Walsh Code availability threshold, that is less than the first Walsh Code availability threshold, reducing the handoff

participation limit to a second participation limit that is less than the first participation limit; and for any mobile terminal participating in handoff with a number of cells or sectors that exceeds the handoff participation limit, *terminating forward link transmissions from a corresponding number of servicing cell(s) or sector(s)* and releasing a corresponding number of Walsh Code(s).” (emphasis added).

Also, Appellant’s Independent Claim 28 recites, *inter alia*, a “base station controller that supports Code Division Multiple Access (CDMA) operations for a group of cells or sectors, the base station controller comprises: . . . a plurality of software instructions that are executed by the processor, the plurality of software instructions include: . . . software instructions that, upon execution by the processor, cause the base station controller to, *when an available number of the number of Walsh Codes becomes less than a first Walsh Code availability threshold, reduce the handoff participation limit to a first participation limit that is less than the maximum participation limit*; software instructions that, upon execution by the processor, cause the base station controller to, *when an available number of the number of Walsh Codes becomes less than a second Walsh Code availability threshold, that is less than the first Walsh Code availability threshold, reduce the handoff participation limit to a second participation limit that is less than the first participation limit*; and software instructions that, upon execution by the processor, *cause the base station controller to, for any mobile terminal participating in handoff with a number of cells or sectors that exceeds the handoff participation limit, terminate forward link transmissions from a corresponding number of servicing cell(s) or sector(s) and releasing a corresponding number of Walsh Code(s)*.” (emphasis added).

Appellant respectfully submits that a *prima facie* case has not been established in that resource replacement of Reed nor the hypothetical combination of Reed with Wakuta *does not*

teach or suggest all the claim limitations as set out in the method of Appellant's Independent Claims 23 and 28, and to those claims depending directly or indirectly therefrom.

Furthermore, Appellant respectfully submits that there is no suggestion or motivation, either in Reed or in the knowledge generally available to one of ordinary skill in the art, to modify the hand-off accelerant of Reed, or to modify the hand-off accelerant of Reed with the mobile station threshold device of Wakuta, to achieve Appellant's claimed invention as set out in Claim 23 and claims 24-27 that depend directly or indirectly therefrom, or to Claim 28 and claims 29-32 that depend directly or indirectly therefrom.

2. *lack of prima facie showing of obviousness supported by the EPO counterpart case issuance over the Reed reference*

Claims 23-32, are presented, are harmonized with the issued claims of Appellant's foreign counterpart, European Patent No. EP 1 466 493, entitled "Walsh Code Management in a Code Division Multiple Access Cellular Wireless Communication System," issued September 28, 2005, and claims priority to the present U.S. Patent Application.

The International Search Report of December 4, 2002, had noted, at that time, that the Reed reference was of "particular relevance." The foreign counterpart nevertheless subsequently issued with the claims as presented. Accordingly, Appellant respectfully submits that the claims 23-32, as harmonized with the counterpart case, similarly overcome the reference of U.S. Patent No. 6,160,798 to Reed et al. ("Reed").

G. Conclusions

For the above-provided reasons, the Appellant respectfully requests that all of the rejections of the Final Office Action be overturned and that the claims in the present application be allowed to issue.

Respectfully submitted,

Date: October 6, 2008

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H. Claims Appendix

Claims 1-22. (cancelled)

23. (Previously Presented) A method for managing Walsh Codes in a Code Division Multiple Access (CDMA) cellular wireless communication system, the method comprises:

- allocating a number of Walsh Codes in the CDMA cellular wireless communication system to a group of cell(s) or sector(s);
- setting a handoff participation limit to a maximum participation limit, where the handoff participation limit determines a maximum number of cells or sectors that may participate in handoff with any serviced mobile terminal;
- when an available number of the number of Walsh Codes becomes less than a first Walsh Code availability threshold, reducing the handoff participation limit to a first participation limit that is less than the maximum participation limit;
- when an available number of the number of Walsh Codes becomes less than a second Walsh Code availability threshold, that is less than the first Walsh Code availability threshold, reducing the handoff participation limit to a second participation limit that is less than the first participation limit; and
- for any mobile terminal participating in handoff with a number of cells or sectors that exceeds the handoff participation limit, terminating forward link transmissions from a corresponding number of servicing cell(s) or sector(s) and releasing a corresponding number of Walsh Code(s).

1 24. (Previously Presented) The method of claim 23, wherein terminating forward link
2 transmissions from a corresponding number of servicing cell(s)/sector(s) and releasing a
3 corresponding number of Walsh Code(s) further comprises:

4 determining a weakest forward link serviced by a weakest cell or sector; and
5 terminating the weakest forward link serviced by the weakest cell or sector.

1 25. (Previously Presented) The method of claim 24, wherein the weakest forward link is
2 determined based upon the strength of corresponding pilot signals, as measured and reported by
3 the mobile terminal.

1 26. (Previously Presented) The method of claim 25, wherein a plurality of reports of pilot
2 signal strengths are used in conjunction with averaging operations to determine the weakest
3 forward link.

1 27. (Previously Presented) The method of claim 23, wherein terminating forward link
2 transmissions from a corresponding number of servicing cell(s)/sector(s) and releasing a
3 corresponding number of Walsh Code(s) further comprises:
4 terminating a weakest forward link when the mobile terminal is in five-way hand-off; and
5 terminating two weakest forward links when the mobile terminal is in six-way hand-off.

1 28. (Previously Presented) A base station controller that supports Code Division Multiple
2 Access (CDMA) operations for a group of cells or sectors, the base station controller comprises:
3 a Mobile Switching Center (MSC) interface that interfaces the base station controller to a
4 MSC;
5 at least one base station interface that interface the base station controller to a plurality of
6 base stations; and
7 at least one digital processor coupled to the base station interface and to the MSC
8 interface; and
9 a plurality of software instructions that are executed by the processor, the plurality of
10 software instructions include:
11 software instructions that, upon execution by the processor, cause the base
12 station controller to allocate a number of Walsh Codes in the CDMA cellular
13 wireless communication system to the group of cells or sectors;
14 software instructions that, upon execution by the processor, cause the base
15 station controller to set a handoff participation limit to a maximum participation
16 limit, where the handoff participation limit determines a maximum number of
17 cells or sectors that may participate in handoff with any serviced mobile terminal;
18 software instructions that, upon execution by the processor, cause the base
19 station controller to, when an available number of the number of Walsh Codes
20 becomes less than a first Walsh Code availability threshold, reduce the handoff
21 participation limit to a first participation limit that is less than the maximum
22 participation limit;

23 software instructions that, upon execution by the processor, cause the base
24 station controller to, when an available number of the number of Walsh Codes
25 becomes less than a second Walsh Code availability threshold, that is less than the
26 first Walsh Code availability threshold, reduce the handoff participation limit to a
27 second participation limit that is less than the first participation limit; and

28 software instructions that, upon execution by the processor, cause the base
29 station controller to, for any mobile terminal participating in handoff with a
30 number of cells or sectors that exceeds the handoff participation limit, terminate
31 forward link transmissions from a corresponding number of servicing cell(s) or
32 sector(s) and releasing a corresponding number of Walsh Code(s).

1 29. (Previously Presented) The base station controller of claim 28, wherein in terminating
2 forward link transmissions from a corresponding number of servicing cell(s)/sector(s) and
3 releasing a corresponding number of Walsh Code(s), the base station controller determines a
4 respective weakest forward link for the mobile terminal and terminates the respective weakest
5 forward link.

1 30. (Previously Presented) The base station controller of claim 29, wherein the base station
2 controller determines the respective weakest forward link based upon the strength of
3 corresponding pilot signals, as measured and reported by the mobile terminal.

1 31. (Previously Presented) The base station controller of claim 30, wherein a plurality of
2 reports of pilot signal strengths are used in conjunction with averaging operations to determine
3 the weakest forward link.

- 1 32. (Previously Presented) The base station controller of claim 28, wherein the base station
- 2 controller operates consistent with at least one of IS-95A, IS-95B, 1xRTT and 1xEV-DO
- 3 operating standards.

I. Evidence Appendix

No Evidence Submitted.

J. Related Proceedings Appendix

No Related Proceedings